

Understanding Callable Securities

PFM Asset Management

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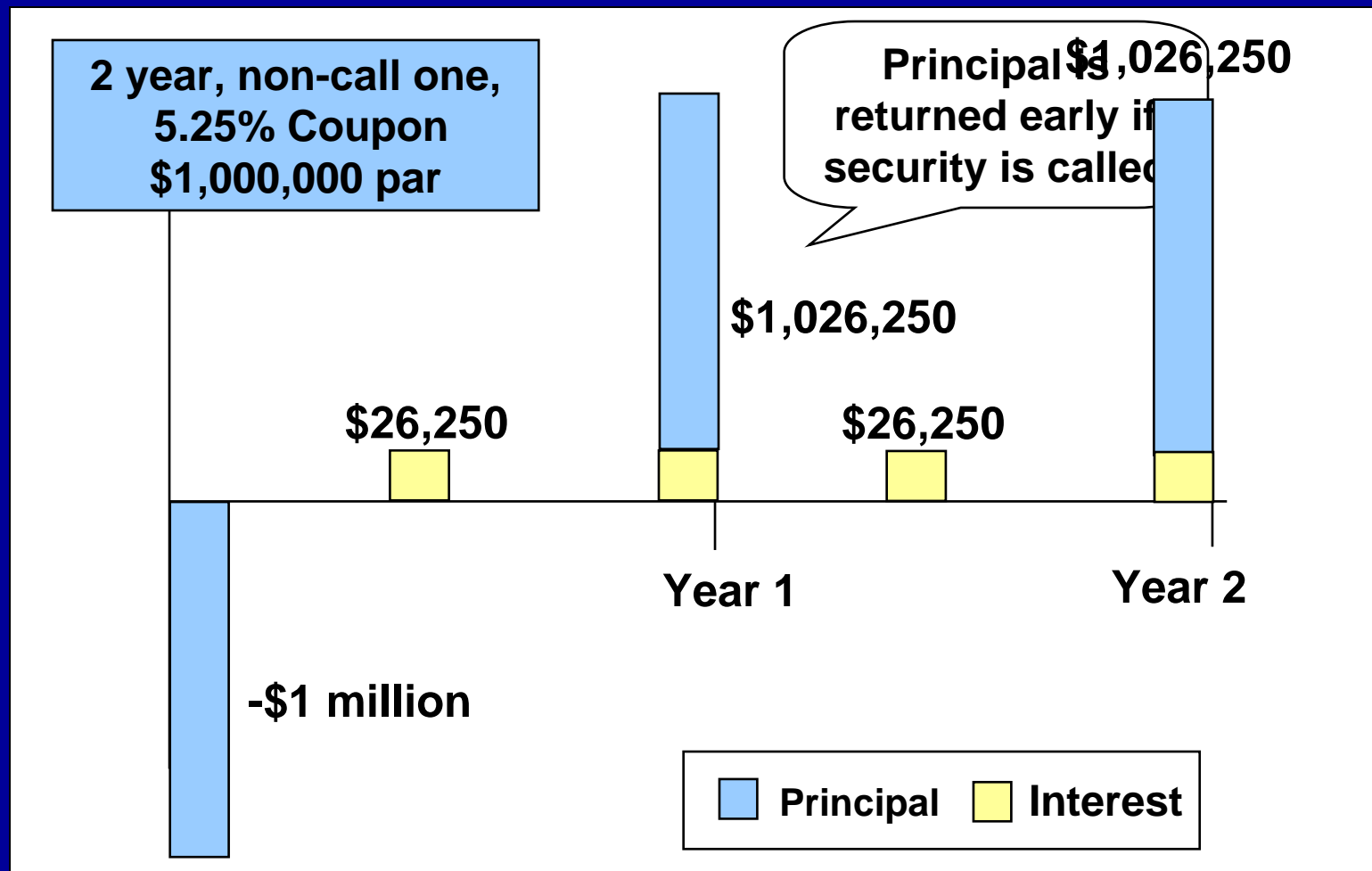
Callable Federal Agencies

- Federal Agency security with a call option
- Call option allows the issuer to redeem the security prior to maturity, at the call date
 - One time
 - Continuously
 - Periodically
- Issuers pay a premium in the form of a higher yield for this feature

$$\frac{\text{Yield on Bullet Security} + \text{Call Option Premium}}{\text{Yield on Callable Security}}$$

- The option premium is based on:
 - Current interest rates
 - Expected future rates
 - Call structure

Callable or Non-Callable



Callable Federal Agency Securities

Pros

High credit quality

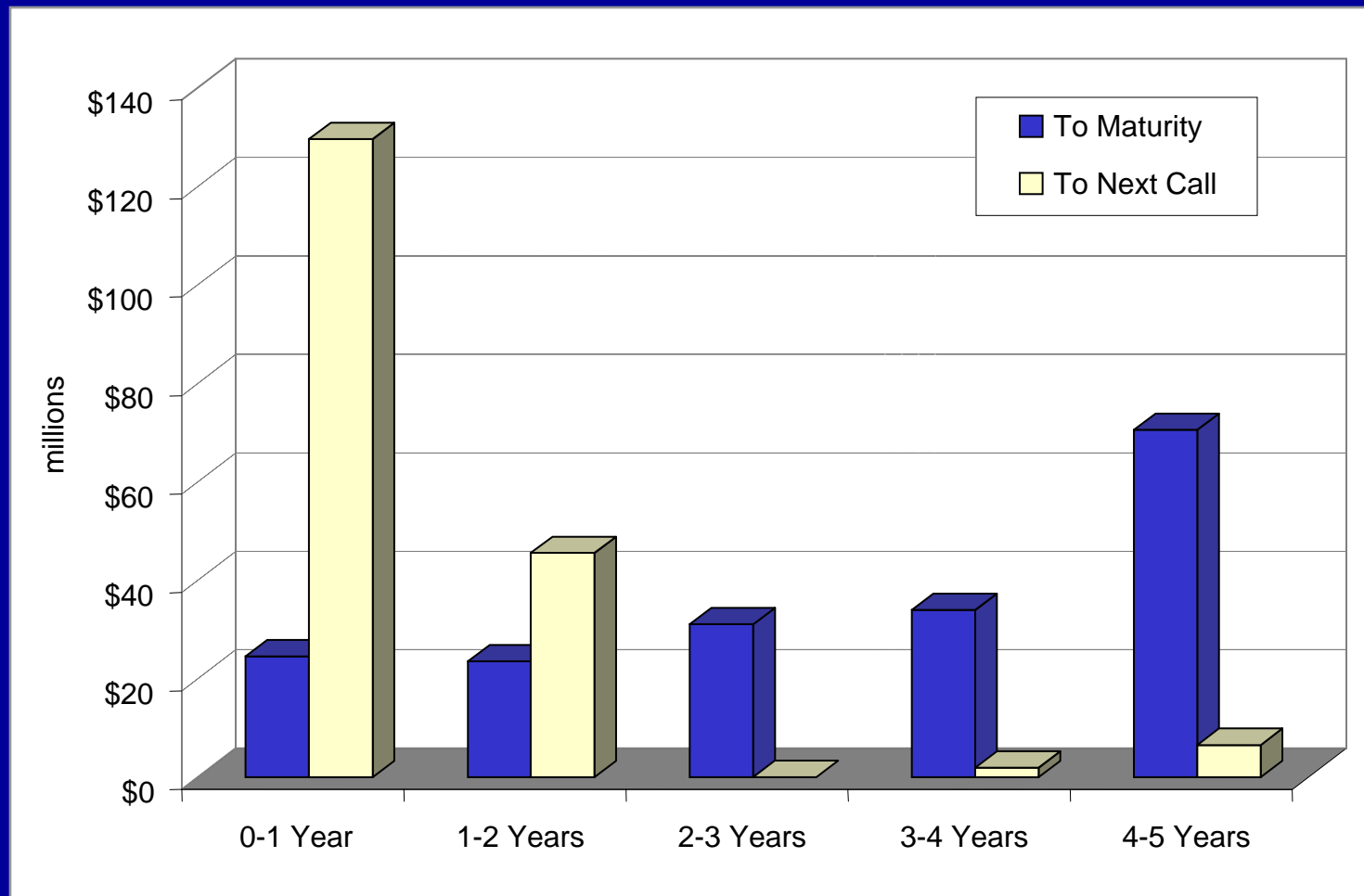
Additional yield advantage

Cons

**Date principal is returned
is uncertain**

**More challenging to
analyze competitive
offers**

Maturity Distribution: Call vs. Maturity Date



Risk of Callable Securities

3-Year U.S. Treasury Note
January 1, 2000 – February 17, 2006



Source: Bloomberg

Current Rates

3-Year Federal Agency	Yield
Bullet (Non-Callable)	4.88%
Non-Call 1-Year; 1-Time Call	5.075%
Non-Call 3-Months; Quarterly Call	5.375%

Rates as of February 9, 2006

Select the Best Offer

Which security would you buy?

	Option 1	Option 2
Type of Issue	New Issue	Secondary Market
Description	FHLMC 5.125%	FNMA 5.10%
Maturity Date	February 27, 2008	February 22, 2008
Call Date	2/27/07 (1-time)	2/22/07 (1-time)
Settles	February 27, 2006	February 22, 2006
Price	100.00	99.94
Yield to Call	5.125%	5.162%
Yield to Maturity	5.125%	5.132%

Advantages

	Option 1	Option 2
Type of Issue	New Issue	Secondary Market
Description	FHLMC 5.125%	FNMA 5.10%
Advantages	Longer time to call date	Higher yield-to-call Higher yield-to-maturity Shorter settlement date (earn yield sooner)

Still Undecided? “OAS” it!

- **Option Adjusted Spread Analysis (OAS) can help you select the cheapest callable security.**
- **OAS models calculate the value of the call option to arrive at an “option-free” yield spread.**
- **The OAS provides an apples-to-apples comparison of callable securities with similar structures.**
- **You can also compare the OAS to yield spreads of similar non-callable securities.**

Option Adjusted Analysis

FHLMC 5.125% New Issue

Calculate	Price	OAS (bp)	Fwd	ATM	Skew	Adj
(P,O,V) <input type="checkbox"/> P)	100	0) + 2.90	Strike	Vol	Vol	
			4.862	16.00	15.58	
			Skew Adj	Exp	1.00	
Cusip / ID#	US3128X4M653	Option Px Value:	0.42			
Settle	2/27/2006	Bench settle	2/17/2006			
Spread	47.2bp vs 2Y	T 4 3/8 01/31/08 Govt@99-15+	(4.653)			

{NUM}<GO> for: 3) Call Schedule 2/27/ 7 100.00		OAS	Option	To Call on	To
		Method	Free	2/27/2007	Mty
	Yld		4.901	5.125	5.125
	Spnd		2.9	21.6	25.3
	M Dur	1.36	0.96	1.88	
	Risk	1.36	0.96	1.88	
	Cnvx	-0.47	0.01	0.05	

Effective Duration

Option Adjusted Analysis

FNMA 5.10% Secondary Market

Calculate **Price** **OAS (bp)** **Volatility**
 (P,O,V) ☐ P) **99.94032** **0) + 3.74** V) **16.00**

Cusip / ID# 31359MH71 Option Px Value: 0.43
 Settle **2/22/2006** Bench settle **2/21/2006**
 Spread **46.0bp vs 2Y** T 4 ³/₈ 01/31/08 Govt@99-14+ (**4.671**)

{NUM}<GO> for:		OAS	Option	To Call on	To
3) Call Schedule		Method	Free	2/22/2007	Mty
2/22/ 7	100.00	Yld	4.906	5.162	5.132
		Spnd	3.8	24.0	26.4
		M Dur	1.34	0.96	1.88
		Risk	1.34	0.96	1.88
		Cnvx	-0.40	0.01	0.05

Effective Duration

Select the Best Offer

Which security would you buy?

	Option 1	Option 2
Type of Issue	New Issue	Secondary Market
Description	FNMA 2.625%	FNMA 3.25%
Maturity Date	May 20, 2005	September 12, 2005
Call Date	5/20/03 (1-time)	9/12/03 (1-time)
Settles	November 20, 2002	November 8, 2002
Price	100.00	100.75
Yield to Call	2.625%	2.33%
Yield to Maturity	2.625%	2.97%

Option Adjusted Analysis

**FNMA 2.625%
New Issue**

Calculate (P,O,V) <input type="checkbox"/> P) <input type="checkbox"/>	Price 100	OAS (bp) 0) + 57.0	Volatility V) 14.00
Cusip / ID#	3136F2TG3	Option Px Value:	0.04
Settle	11/20/2002		
Spread	79.1bp vs 2Y	T 2 's 10/31/04 Govt@100-18	(1.834)

{NUM}<GO> for: 3) Call Schedule 5/20/ 3 100.00		OAS	Option	To Call on	To
		Method	Free	5/20/2003	Mty
	Yld		2.610	2.625	2.625
	Spnd		57.0	137.9	58.6
	M Dur	1.81		0.49	2.40
	Risk	1.81		0.49	2.40
	Cnvx	-2.07		0.00	0.07

Effective Duration

Option Adjusted Analysis

FNMA 3.25% Secondary Market

Calculate (P,O,V)	<input type="checkbox"/>	Price	OAS (bp)	Volatility
	<input type="checkbox"/>	P) 100-24	O) + 71.0	V) 14.00
Cusip / ID#	31359MPC1	Option Px Value:	0.26	
Settle	11/12/2002			
Spread	172.6bp vs 6MO B 0 05/08/03 Govt @1.22			(1.245)

{NUM}<GO> for:	OAS	Option	To Call on	To
3) Call Schedule	Method	Free	9/12/2003	Mty
9/12/ 3 100.00	Yld	2.876	2.333	2.971
	Sprd	70.6	99.2	80.1
	M Dur	1.75	0.81	2.67
	Risk	1.77	0.82	2.71
	Cnvx	-1.90	0.01	0.09

Effective Duration

More Yield = Better Returns?

Not Always

- When buying callable securities, more yield does not always equal more income or better returns!
- Reinvestment risk: securities get called when rates fall, thus reducing income
- Negative convexity: price appreciation is limited while potential price decline is unlimited